

# Work Order ID 59888

Tuesday, June 15, 2010 4:04:23 PM



Page 1

Item ID: D407-667-205

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Aft

Start Date: 6/15/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 6/22/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Date: 6-15

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D407-667-245	Rev F								

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D407-667-205 CHG006

8/10/08/05

10-8-25

110

0.00



Pick Kit

Packaging

Memo

0.00

Packaging

Packaging

DP

10-8-3

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio FT

DP

10-8-3

**Work Order ID 59888**

Tuesday, June 15, 2010 4:04:23 PM



Page 2

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Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

130

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

8/10/08/04

Quality Control

**Work Order ID 59888**

Tuesday, June 15, 2010 4:04:23 PM



Page 3

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Cust Item ID:

Required Date: 6/22/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

140

0.00



Crosstubes

Crosstubes

**Memo**

0.00

1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes.

2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Check dimensions between holes on all four sides.

3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins.

4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes.

5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245

6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes.

7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes.

8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint.

9- Scribe tube to identify on the inner chamfer in the cuff D# and B#

10-Deburr & Inspect for surface damage. Repair damage within limits as per

MB / AWM  
10-08-05

MB  
10-08-09

**Work Order ID 59888**

Tuesday, June 15, 2010 4:04:23 PM



Page 4 :

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Cust Item ID:

Required Date: 6/22/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run Hours

Tool ID

Tool #

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Dwg D407-667-245

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

(K) MB 10-08-09

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

8/10/08/09

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

8/10/08/09

(H)

[illegible]

Page 5

**Accept**

**Setup Start**

**Stop**

**Cust Item ID:**

11/11/11 11:11 AM

**Customer:**

**Reference:**

Run Start

**Stop**

**Insp.  
Stamp**

0.00

**00000000000000000000**

Outsource2

## Memo

0.00

### Outsource process - NDT

Liquid Penetrant Inspection as per QSI 0380  
Issue P/O: 12394 LPI as per ASTM 1417  
Level 2 Attach copy of NDT results to work order

CZ 10/8/12 ①

0.00



### Packaging

## Packaging

## Memo

0.00

### Packaging

Ensure copy of NDT results attached to work order.

CZ 10/8/12      ②

QC5- Inspect part completeness to step on W/O

0.00



QC

## Memo

0.00

## Quality Control

BT 10-08-16 (x)

**Work Order ID 59888**

Tuesday, June 15, 2010 4:04:23 PM

Page 6

Item ID: D407-667-205

Accept

Setup Start

Revision ID:

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Item Name: Crosstube Aft

Start Date: 6/15/2010 Start Qty: 1.00

Cust Item ID:

Required Date: 6/22/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_  
QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
210		0.00							
	SprayPaint								
SprayPaint	Memo	0.00							
Spray Painting	1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2 PRIME: Start Time: 7:00 Fininsh Time: 8:00  PAINT: Start Time: 6:00 Finish Time: 7:00								PT 1008-20 Pto
220	QC14- Inspect Spray Paint	0.00							
	QC								
QC	Memo	0.00							
Quality Control	Then, Wrap in plastic bag to protect from scratches								8/10/08/23 (70)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
		<del>11/11/17 10563</del> <del>11/11/17 18x</del>	<del>SD</del>	<del>10/08/24</del>			

Part No: 0407-667-205 PAR #: \_\_\_\_\_ Fault Category: x-tubes NCR: Yes No DQA: Yes Date: 1008-16  
 Resolution: re-work Disposition: rework QA: N/C Closed: Yes Date: 10/08/27

NCR: <u>59888</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10-08-16	210	Deep machining marks were found on the inside of one cuff Ref Qug# 407-667-245 TAN section M one cuff only *MARKS cross over bolt holes.* R.C. LON	[Signature]	Polish inside of tube to remove machining marks	AWM 10-08-17	[Signature]	[Signature]	[Signature]
				re alodine	AWM 10-08-17			
				QC3/QC5	100823			
			[Signature]	Inform dept of the issue. E.D	AWM 10-08-18			

NOTE: Date & initial all entries

# Work Order ID 59888

Tuesday, June 15, 2010 4:04:23 PM



Page 7

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Item Name: Crosstube Aft

Stop



Start Date: 6/15/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 6/22/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

0.00



Crosstubes

Crosstubes

Memo

0.00

1-Install abrasion strips as per QSI 035 using DT8674. Install chafing shield as per Dwg D407-667-245. Note: (3) top holes should be facing up.

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

3-Install support with magnobond and install clamps as per Dwg D407-667-245 using installation jig DT9025. Torque clamps to 80-100 in lb

A/R Magnobond Batch: 114-158  
EXP: 11-08-03

4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.

25 10 08 23

240

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

5 10/08/24

(74)



**Work Order ID 59888**

Tuesday, June 15, 2010 4:04:23 PM



Page 8

Item ID: D407-667-205

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Setup Start



Revision ID:

Item Name: Crosstube Aft

Stop



Start Date: 6/15/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 6/22/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250	Pick Kit	0.00							
Packaging	Memo	0.00							
Packaging									
260	QC4- 100% Inspect kits for completeness	0.00							
QC	Memo	0.00							
Quality Control									
270	Packaging	0.00							
Packaging	Memo	0.00							
Packaging	Identify and in kanban rack								
	Location: <u>57</u>								

# Work Order ID 59888

Tuesday, June 15, 2010 4:04:23 PM



Page 9

Item ID: D407-667-205

Accept



Setup Start



Revision ID:

Item Name: Crosstube Aft

Stop



Start Date: 6/15/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 6/22/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

280

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

10/08/27 *[Signature]*

*mtf*  
10-8-24

# Picklist Print

Tuesday, June 15, 2010 4:04:28 PM

Page 1

Work Order ID: 59888

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft



Start Date: 6/15/2010

Required Date: 6/22/2010

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev: C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM  
IPP Rev: D Added Magnobond, Rubber Cushion & Clamps 07-02-19  
JLM

\*\*\*\*CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER\*\*\*\*

IPP Rev: E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified by: EC

IPP Rev: F 08-06-12 add comment in seq. 24 DD verified by: EC

IPP Rev: G 08-08-19 revE as per dwg DD verified by: EC

IPP Rev: H 09.01.06 ECN 08-562 EC verified by: DD IPP Rev: I

10.04.07 revise route seq. in bom DD verified by: JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205TRN		Manufactured	No			110	Each	2.0000	1	1			



Crosstube Turning Detail

## Location

## Loc Qty

## Loc Code

LG

2

58389

1

58390

1

AN960JD516

NAS1149D0563J

Purchased

No



Washer

D2856-400

Manufactured

No



Abraison Strip

## Location

## Loc Qty

## Loc Code

ST403

240.9888

50593

43.4568

56626

197.532

DP

10-8-3

0.0000

18

18



M114742, 10/24/51

240.9888

1.288

1.355789



ST 10-08-24

K 1.288

# Picklist Print

Tuesday, June 15, 2010 4:04:28 PM

Page 2

Work Order ID: 59888

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Start Date: 6/15/2010

Required Date: 6/22/2010

Start Qty: 1.00

Required Qty: 1.00

D2873-043	Manufactured	No	230	Each	48.0000	2	2
Nut Plate Assembly							RT 10-08-24

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	48	
53966	20	x2
56466	8	
57337	20	

D2873-045	Manufactured	No	230	Each	44.0000	2	2
Nut Plate Assembly							RT 10-08-24

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	44	
53967	5	
53968	20	x2
57336	19	

D2894-1	Manufactured	No	230	Each	19.0000	1	1
2.750 Support							RT 10-08-23

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	19	
43713	5	
43881	14	x1

D3190-1	Manufactured	No	230	Each	36.0000	2	2
Chafing Shield							RT 10-08-24

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	36	
47456	16	x2
58569	20	

# Picklist Print

Tuesday, June 15, 2010 4:04:28 PM

Page 3

Work Order ID: 59888

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Start Date: 6/15/2010

Required Date: 6/22/2010

Start Qty: 1.00

Required Qty: 1.00

D3595-063-450

Manufactured No

230

Each

74.9790

2

2



RUBBER CUSHION

6098341



RT 10-08-23

## Location

## Loc Qty

## Loc Code

LG

74.97897368

53775

5.97897368

58161

24

59580

45

MS20601-AD4W8

Purchased

No

230

Each

342.0000

14

14



RIVET

~~MS20601-AD4W8~~ X 14



RT 10-08-24

## Location

## Loc Qty

## Loc Code

ST322

342

108521

98

112203

244

MS21920-22

Purchased

No

230

Each

118.0000

4

4



Clamp(per MIL-DTL-8783C)



RT 10-08-24

## Location

## Loc Qty

## Loc Code

LG

118

111210

19

114077

99

X4

Tuesday, June 15, 2010 4:04:28 PM

Shop Packet Print

Page 3

# Picklist Print

Tuesday, June 15, 2010 4:04:28 PM

Page 4

Work Order ID: 59888

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Start Date: 6/15/2010

Required Date: 6/22/2010

Start Qty: 1.00

Required Qty: 1.00

MS21920-25

Purchased

No

230

Each

120.0000

2

2



Clamp(per MIL-DTL-8783C)



10-08-23

## Location

## Loc Qty

## Loc Code

LG

75

113281

0

114759

50

114901

25

ST451

45

113281

5

113282

18

113744

1

114141

21

AN5-10A

Purchased

No

260

Each

153.0000

10

10



Bolt



10/12/2010

## Location

## Loc Qty

## Loc Code

ST337

153

114199

52

114227

1

114752

100

AN5-32A

Purchased

No

260

Each

178.0000

4

4



Bolt



10/18/2010

## Location

## Loc Qty

## Loc Code

ST340

178

113121

28

114056

100

114405

50

Tuesday, June 15, 2010 4:04:28 PM

Shop Packet Print

Page 4

# Picklist Print

Tuesday, June 15, 2010 4:04:28 PM

Page 5

Work Order ID: 59888

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft



Start Date: 6/15/2010

Required Date: 6/22/2010

Start Qty: 1.00

Required Qty: 1.00

AN5-34A

Purchased

No

260

Each

104.0000

4



Bolt



10/8/24 SD

Location

Loc Qty

Loc Code

ST340

104

113149

54

113226

50

4

MS21042L5

Purchased

No

260

Each

715.0000

4



Nut



4  
10/8/24 SD

Location

Loc Qty

Loc Code

ST139

500

114813

500

ST300

215

114449

215

4

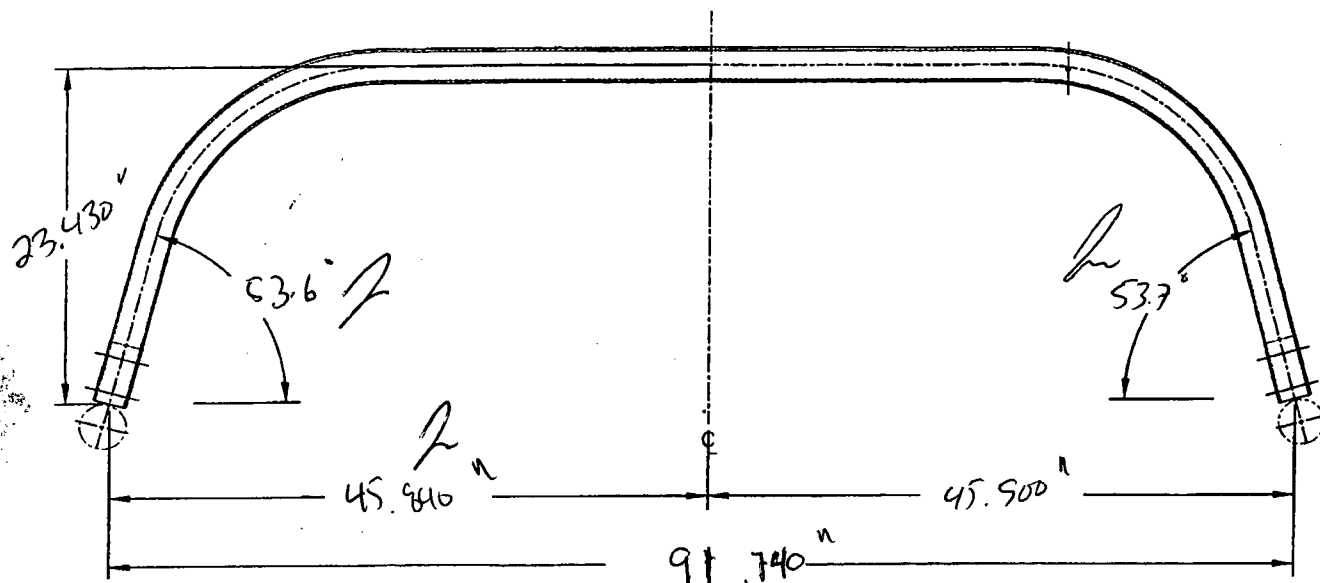
Tuesday, June 15, 2010 4:04:28 PM

Shop Packet Print

Page 5

<b>DART AEROSPACE LTD</b>		<b>Work Order:</b>	39886
<b>Description:</b> Crosstube High Aft (407)		<b>Part Number:</b>	D407-667-205
<b>Inspection Dwg:</b> D407-667-245 <b>Rev:</b> F		<b>Page 1 of 1</b>	

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	45.86	45.98
Angle	54	56
Total Span	91.72	91.96



Comments

QC15 Inspection	S 10/08/04
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	



Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

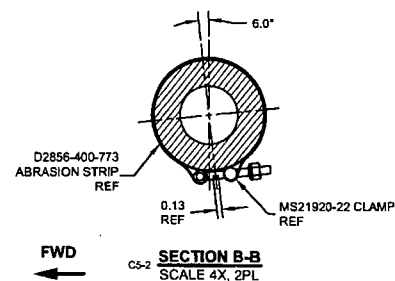
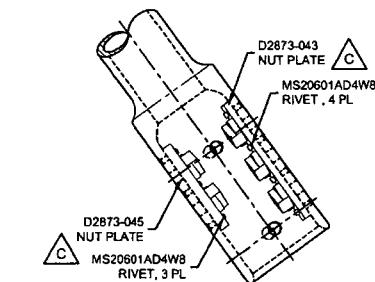
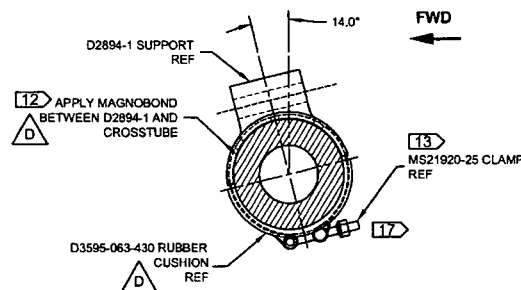
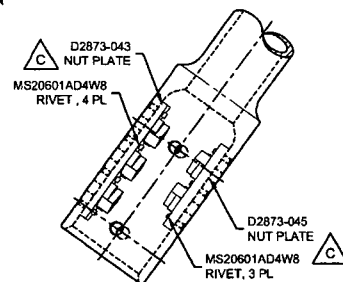
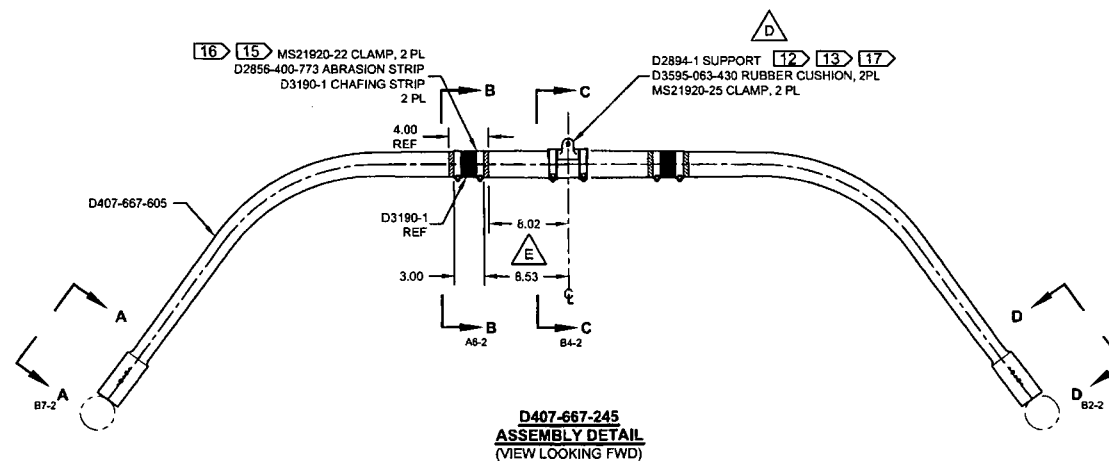
#### GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6011-115  
FINISHED LENGTH = 112.91±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 27.7 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.  
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY  
RETURN TO  
ENGINEERING  
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SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 55588  
B810-6-15

RELEASED  
08/11/06

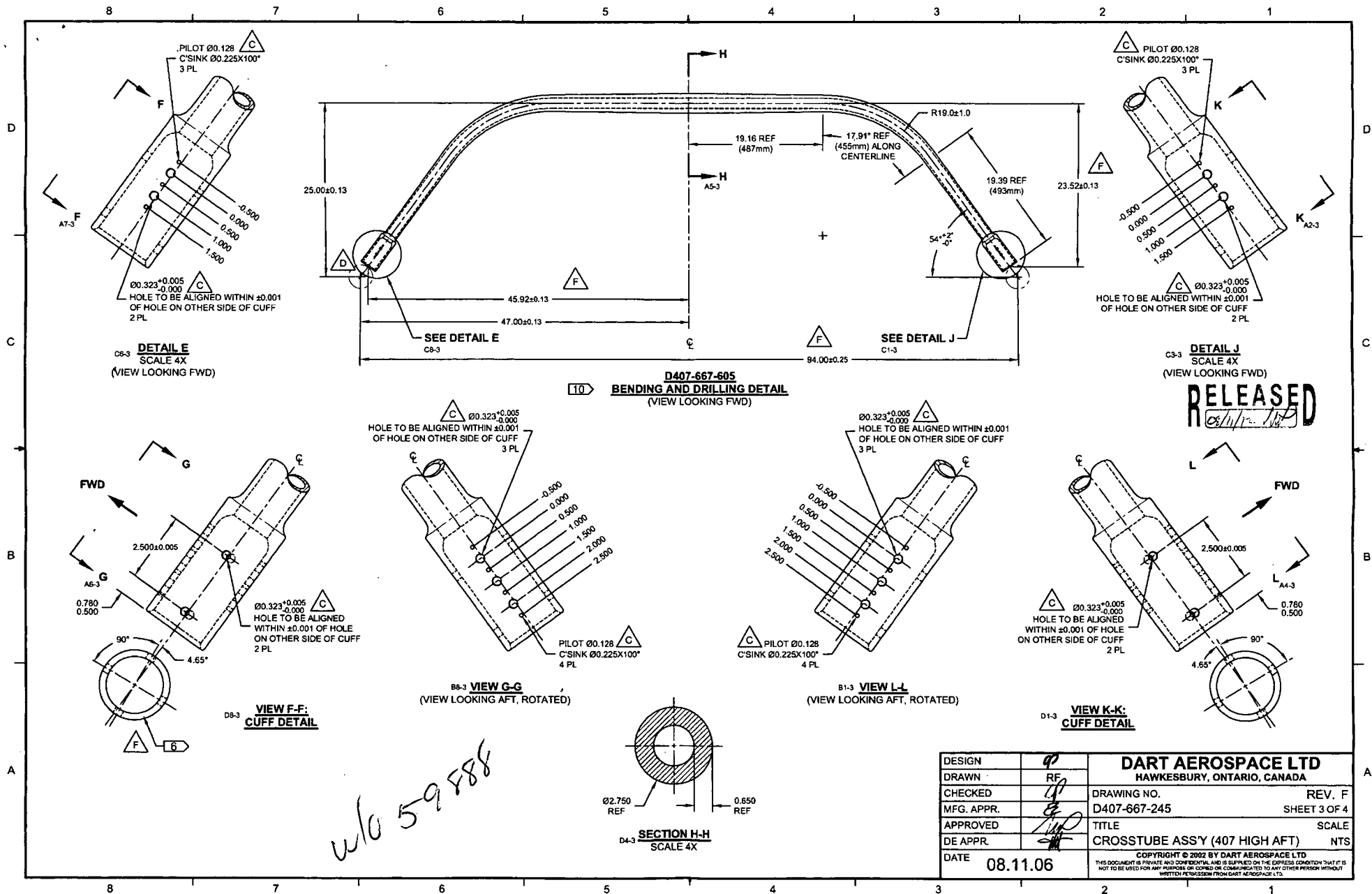
F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C8-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	<u>90</u>	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<u>90</u>	DRAWING NO.	REV. F
MFG. APPR.	<u>90</u>	D407-667-245	SHEET 1 OF 4
APPROVED	<u>90</u>	TITLE	SCALE
DE APPR.	<u>90</u>	CROSSTUBE ASSY (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE REPRODUCED OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

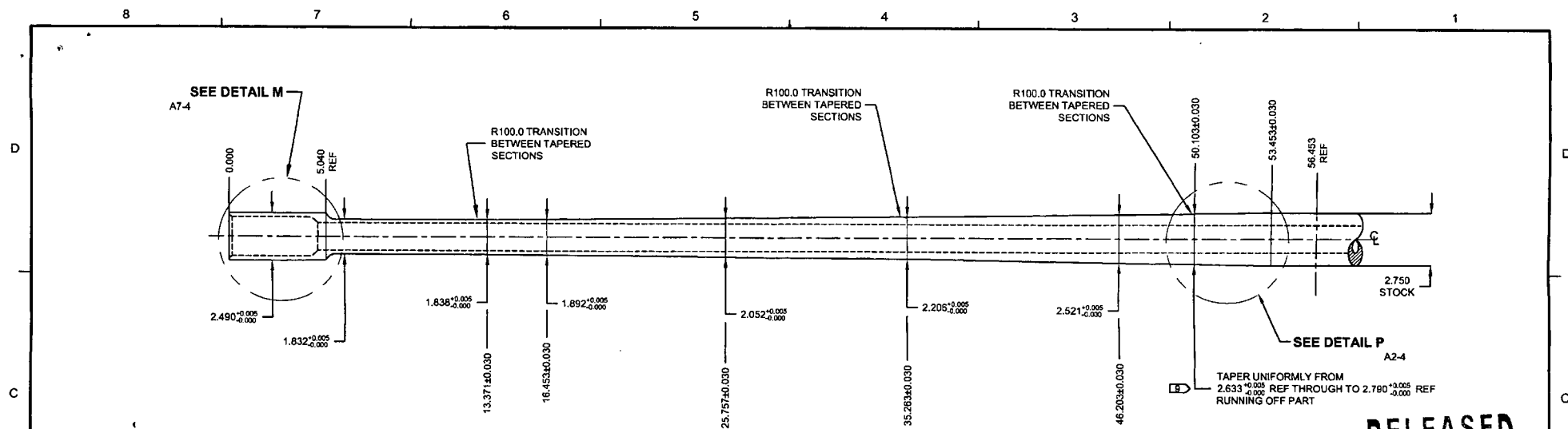


DESIGN	47	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	47	DRAWING NO.	REV. F
MFG. APPR.	47	D407-667-245	SHEET 2 OF 4
APPROVED	47	TITLE	SCALE
DE APPR.	47	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	08.11.06	COPYRIGHT © 2002 BY DART AEROSPACE LTD	
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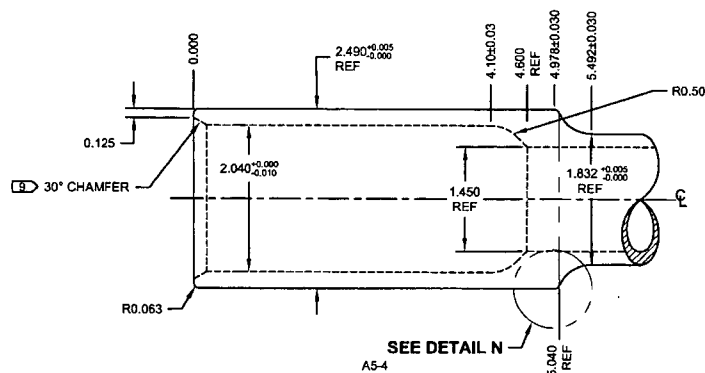
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08/11/12

w/0 59888

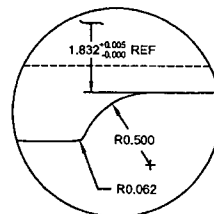




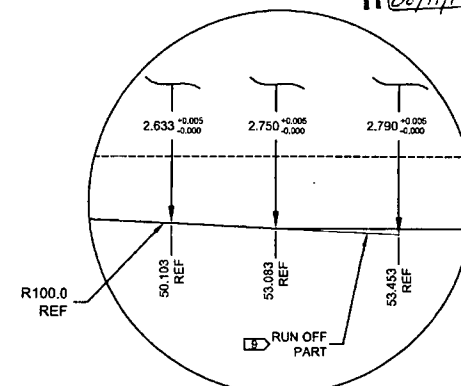
**D407-667-245 MACHINING DETAIL**



D8-4 DETAIL M: CROSSTUBE CUFF  
SCALE 3X



86-4 DETAIL N: CUFF TRANSITION  
SCALE 2X



C1-4 **DETAIL P: TAPER RUN-OFF**  
NOT TO SCALE

DESIGN	<i>Q</i>	<b>DART AEROSPACE LTD</b>	
DRAWN	RF	<b>HAWKESBURY, ONTARIO, CANADA</b>	
CHECKED	<i>Q</i>	DRAWING NO.	REV. 1
MFG. APPR.	<i>RF</i>	D407-667-245	SHEET 4 OF 4
APPROVED	<i>RF</i>	TITLE	SCALE
DE APPR.	<i>RF</i>	CROSSSTUBE ASS'Y (407 HIGH AFT)	NT
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## 5.0 PARTS LIST

REFERENCE ONLY

Item	Qty -011	Qty -013	Qty -015	Qty -101	Qty -201	Qty -103	Qty -203	Qty -105	Qty -205	Part Number	Description
	X									D206-667-011	SPACER BLOCK KIT
		X								D206-667-013	NUT PLATE KIT (-101/-103/-105/-203/-205)
			X							D206-667-015	NUT PLATE KIT (-201)
				X						D206-667-101	CROSSTUBE INSTALLATION, 206A/B HIGH FWD
					X					D206-667-201	CROSSTUBE INSTALLATION, 206A/B HIGH AFT
						X				D206-667-103	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 HIGH FWD
							X			D206-667-203	CROSSTUBE INSTALLATION, 206L/L-1/L-3/L-4 HIGH AFT
								X		D407-667-105	CROSSTUBE INSTALLATION, 407 HIGH FWD
									X	D407-667-205	CROSSTUBE INSTALLATION, 407 HIGH AFT
1				1						D206-667-141	CROSSTUBE ASSEMBLY, 206A/B HIGH FWD
2					1					D206-667-241	CROSSTUBE ASSEMBLY, 206A/B HIGH AFT
3						1				D206-667-143	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 HIGH FWD
4							1			D206-667-243	CROSSTUBE ASSEMBLY, 206L/L-1/L-3/L-4 HIGH AFT
5								1		D407-667-145	CROSSTUBE ASSEMBLY, 407 HIGH FWD
6									1	D407-667-245	CROSSTUBE ASSEMBLY, 407 HIGH AFT
10				*2	*2	*2		*2		D2891-1	SUPPORT
11							*2			D2892-1	SUPPORT
12									*1	D2894-1	SUPPORT
13				*2	*2	*2		*2		D2856-400-694	ABRASION STRIP
14							*2		*2	D2856-400-773	ABRASION STRIP
15									*1	D2856-600-851	ABRASION STRIP
16				*4	*4	*4		*4		MS21920-20	CLAMP
17							*4		*4	MS21920-22	CLAMP
18									*2	MS21920-24	CLAMP
19				4	4	4		4		AN5-32A	BOLT
20							4		4	AN5-34A	BOLT
21				4	4	4	4	4	4	MS21042L5	NUT (OR MS21042-5)
22				8	8	8	8	8	8	AN960JD516	WASHER
23									*2	D3190-1	CHAFING SHIELD
30	8									AN4-6A	BOLT
31	8									AN4-7A	BOLT
32	16									AN960JD416	WASHER
33	2									D3193-041	SPACER BLOCK ASSEMBLY
40		2		*2		*2	*2	*2	*2	D2873-043	NUT PLATE
41		2		*2		*2	*2	*2	*2	D2873-045	NUT PLATE
42			2		2					D2872-043	NUT PLATE
43			2		2					D2872-045	NUT PLATE
44		10		10		10				AN5-7A	BOLT
45		10	10		10		10	10	10	AN5-10A	BOLT
46		4	4	4	10	4		4		AN5-30A	BOLT
47		4					4		4	AN5-32A	BOLT
48		18	18	10	12	10	10	10	10	AN960JD516	WASHER
49		4	4		6					MS21042L5	NUT (OR MS21042-5)

\*REFERENCE ONLY. PARTS ARE INCLUDED IN D206-667-141/241/143/243, &amp; D407-667-145/245 ASSEMBLIES ABOVE

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Revision: C

Date: 05.07.26



## LIQUID PENETRANT TEST REPORT

P- 05489

CLIENT

ATTENTION

ADDRESS

PROJECT

ITEM(S) EXAMINED

DATE

ACUREN JOB NO.

PO/VO NO.

WORK LOCATION

ACCEPTANCE STD.

PAGE

OF

TIME

AM

PM

REV./DATE

JOB DESCRIPTION

PROCEDURE NO. LT-002 REV./DATE

TECHNIQUE NO. LT-002 REV./DATE

PART NO.

MATERIAL

THICKNESS

SCOPE

## TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	MAGNAFLUX		BLACK LIGHT S/N	13798	OUTPUT > 1000 $\mu$ W/cm <sup>2</sup>
PENETRANT	ZL-67	MINIMUM DWELL TIME	10	MIN.	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER	H-20	MINIMUM DRY TIME	>10	MIN.	OTHER
DEVELOPER	SKD-52	MINIMUM DWELL TIME	10	MIN.	LIGHT METER S/N
DEVELOPER TYPE	<input type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY				CAL DUE DATE

## TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

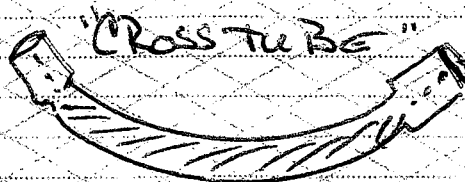
## RESULTS-

☐ METRIC ☒ IMPERIAL

ITEM	COMMENTS	ACCEPT	REJECT
#1	Wet Fluor L.P.I. ON 100% EXTER SURF.	✓	X
1	CROSS TUBE - W.O. ID 59887	✓	
2	CROSS TUBE - W.O. ID 59888	✓	
3	CROSS TUBE - W.O. ID 61074	✓	
4	CROSS TUBE - W.O. ID 61075	✓	
5	CROSS TUBE - W.O. ID 60258	✓	
6	CROSS TUBE - W.O. ID 60259	✓	

JIT 10-0816

ITEM ID: - D407-667-25 (ITEM# 1 & 2)  
ITEM ID: - D212-664-01 (ITEM# 3 & 4)  
ITEM ID: - D212-664-107 (ITEM# 5 & 6)



## Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

## Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

## SIGNATURES

CLIENT REPRESENTATIVE

TECHNICIAN (SIGNATURE):

NAME (PRINT):

Ben Titley

PRINT

SIGNATURE

1<sup>ST</sup> TECHNICIAN

CGSB LEVEL

SNT LEVEL

CGSB REG. NO.

344

CGSB LEVEL

SNT LEVEL

CGSB REG. NO.

DTR # E48667

REPORT

REVIEWED BY:

NAME

INITIALS

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CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY

PT-8

